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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/882,351	06/15/2001	Won-Il Jung	45323/DBP/Y35	8658
23363	7590	08/26/2004	EXAMINER	
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PASADENA, CA 91109-7068			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 08/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/882,351

Applicant(s)

JUNG, WON-IL

Examiner

Elena Tsoy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,7-14 and 17-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,7-14 and 17-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8/9/04.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Response to Amendment

1. Amendment filed on July 23, 2004 has been entered. Claims 1, 2, 4, 7-14, 17-23 are pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1, 2, 4, 7-14, 17-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rourke et al (US 4,720,910) in view of Shackle (US 6,174,623).

As to claims 2, 7, 8, 10-13, 17-23, Rourke et al disclose a method of preparing a plurality of encapsulated particles for the as active cathode electrode (positive active) material (See column 1, lines 7, 40-41) for a lithium secondary battery (See column 2, line 20), wherein particles of an insertion compound such as lithium complex metal oxide or V₂O₅ (See column 2, lines 12-14) are encapsulated in an electronically and ionically conducting polymeric material (See column 1, lines 66-68; column 2, lines 1-5) consisting of polyethylene oxide containing an inorganic salt to render the polymer ionically conductive (*a second conductive polymer*) (See column 2, lines 34-36) and an electronically conductive filler such as carbon black (*conductive agent*) to the polymer electronically conductive (See column 2, lines 36-38). The method comprises dispersing the insertion particles in a solution of the polymer in a solvent such as chlorinated hydrocarbon (See column 2, lines 52-55) in the presence of the conductive filler (See column 2, lines 46-48), and evaporating the solvent using a spray dryer (See column 4, lines 4-6)

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thereby forming particles in which the lithium complex metal oxide is encapsulated within a polymeric shell containing the inorganic salt and conductive filler (See column 1, lines 43-54; column 3, lines 40-55). The amount of coated conductive polymer ranges from 6-11 to 52-90 wt % based on the weight of the lithium metal oxide (See column 3, lines 14-31).

The Examiner's Note: a coating layer of the coated lithium complex metal oxide particle having diameter of 2 microns would clearly have thickness less than 1 micron since the particle is constructed from 70 wt % of the core and 18 wt % of the coating layer (See column 6, lines 36-45).

Rourke et al fail to teach that: a conductive filler is a mixture of carbon black (conductive agent) and a conductive polymer (*a first conductive polymer*), which is dissolved in the solvent together with polyethylene oxide, and selected from the group consisting of polypyrrole, polyaniline, polythiophene and polyacetylene and derivatives thereof (Claim 1); the conductive polymer being in emeraldine base or a polymer in doping state (Claim 4); the lithium complex metal oxide is lithium-containing manganese-based metal oxide (Claim 14) such as LiMn_2O_4 (Claim 9).

As to claims 1, 4, Shackle teaches that co-pending 08/163,209 (now US 5,418,089), the disclosure of which is incorporated in its entirety, disclosed that the replacement of carbon as the conductive component of the cathode with a conducting polymer such as polypyrrole, polyacetylene, polyaniline, preferably polyaniline and a dopant (*a first conductive polymer*) (See column 2, lines 47-57) in an electrochemical cell improves the electronic conductivity of the cathode (See column 2, lines 1-8). Shackle further teaches that the conducting polymer can be

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used as a solution in ordinary solvents such as chloromethane (chlorinated hydrocarbon) (See column 2, lines 64-67) for coating cathode-active particles (See column 2, lines 47-57).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have at least partially replaced carbon black in Rourke et al with a conducting polymer such as polypyrrole, polyacetylene, polyaniline, preferably polyaniline and a dopant by dissolving the conducting polymer together with polyethylene oxide in chlorinated hydrocarbon, with the expectation of providing the desired improved electronic conductivity of the cathode, as taught by Shackle.

It is held that it is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose....

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a mixture of a conducting polymer such as polypyrrole, polyacetylene, polyaniline, preferably polyaniline and a dopant and carbon black, i.e. at least partially replaced carbon black in Rourke et al by dissolving the conducting polymer together with polyethylene oxide in chlorinated hydrocarbon in the presence of carbon black, with the expectation of providing the desired improved electronic conductivity of the cathode, as taught by Shackle.

As to claims 9, 14, Shackle teaches that V_2O_5 is functionally equivalent to lithium-containing manganese-based metal oxide such as $LiMn_2O_4$ for the use as a cathode-active material (See column 6, lines 25-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used $LiMn_2O_4$ instead of V_2O_5 in Rourke et al since Shackle teaches that V_2O_5

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is functionally equivalent to lithium-containing manganese-based metal oxide such as LiMn_2O_4 for the use as a cathode-active material, and the selection of any of these known cathode-active materials in Rourke et al would be within the level of ordinary skill in the art.

4. **Claims 1, 2, 7, 8-13, 17-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rourke et al (US 4,720,910) in view of Amano et al (US 6,235,433).

Rourke et al are applied here for the same reasons as above.

Rourke et al fail to teach that: a conductive filler is a mixture of carbon black (conductive agent) and a conductive polymer (a first conductive polymer), which is dissolved in the solvent together with polyethylene oxide, and selected from the group consisting of polypyrrole, polyaniline, polythiophene and polyacetylene and derivatives thereof (Claim 1).

Amano et al teach that both carbon black and a conductive polymer selected from the group consisting of derivatives of polypyrrole, polyaniline, polythiophene and polyacetylene or are suitable for the use as an electric conductivity aid for making a positive electrode of a secondary battery by dissolving the polymer aid in a proper solvent (See column 10, lines 38-63).

It is held that it is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose....

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a mixture of a conducting polymer such as polypyrrole, polyacetylene, polyaniline, preferably polyaniline and a dopant and carbon black, i.e. at least partially replaced carbon black in Rourke et al with the conducting polymer or mixture thereof by dissolving the

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conducting polymer together with polyethylene oxide in chlorinated hydrocarbon in the presence of carbon black, with the expectation of providing the desired electronic conductivity of the cathode, as taught by Amano et al.

Response to Arguments

5. Applicant's arguments with respect to claims 1, 2, 4, 7-14, 17-23 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is (571) 272-1429. The examiner can normally be reached on Mo-Thur. 9:00-7:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Elena Tsoy
Primary Examiner
Art Unit 1762

ELENA TSOY
PRIMARY EXAMINER



August 23, 2004